CHAPTER VII: *Heart Disease and Stroke*

A. Overview

Cardiovascular disease (CVD) refers to conditions of the heart and blood vessels of the body and includes coronary heart disease, cerebrovascular disease, and peripheral vascular disease. The majority of CVD deaths are from coronary heart disease (CHD) including acute myocardial infarction, (heart attack) and cerebrovascular disease (stroke or brain attack). [1]

Despite gains in the clinical management of cardiovascular disease and associated risk factors, CHD continues to be the leading cause of death in the United States and Hawaii. The American Heart Association in their 1998 statistics reported that in the 1995, 58,200,000 Americans - more than one in five - had one or more types of cardiovascular disease and one in five had some form of major cardiovascular disease. Heart attack is the single largest killer of American males and females and brain attack ranks third.[2]

Thousands of Hawai`i residents suffer preventable and premature death, illness and disability due to cardiovascular disease. In the 1996, more that 2,900 deaths were attributed to some form of CVD. These conditions account for 38 percent of all deaths in the state. In 1995, there were 14,378 hospital discharges with a primary CVD diagnosis. This represents approximately 11% of all discharges. Nearly $300,000,000 in total hospital charges, in that same period, were attributed to a primary diagnosis of CVD, and represented nearly four times the average charge of all other discharges.[3]

Although Hawaii's CHD Mortality rates are better than the national objective, not all segments of the population have benefited equally from recent improvements. Analysis of CVD deaths from 1988 - 1992 shows that mortality from coronary heart disease (CHD) in Native Hawaiian males (176.2\100,000) and Caucasian males (137.6\100,000) was above other major ethnic groups in the state and exceeded the national goal, as defined by *Healthy People 2000,* of 100\100,000. In sharp contrast to the lower CHD mortality rates usually experienced by women, Native Hawaiian females had mortality rates above the national goal and above rates of all males in Hawaii, except Native Hawaiian and Caucasians.

The Hawai`i stroke rate (27.2\100,000) was higher than the national goal (20\100,000) and has not shown any significant improvement since the early 1980's. The Filipino male population's mortality rate for stroke, 38.6\100,000, followed by the Hawaiian males, 34. 5\100,000, demonstrates their tendencies for this disease.[4]

There has been a significant decrease in the overall risk factors for CVD in Hawai`i, but it is not demonstrated across all ethnicities and genders equally. Although the prevalence of elevated cholesterol, hypertension, and smoking has decreased since the mid-1980s, they remain serious risk factors for a large proportion of the population. Lack of physical activity and obesity, significant risk factors for CVD, appear to be worsening among Hawaii residents. Risk factors are more prevalent in certain ethnic groups, therefore putting them at greater risk for CVD. The

Native Hawaiian population has the highest prevalence of the modifiable cardiovascular risk factors: obesity, diabetes, hypertension, high cholesterol and smoking.

Although CVD mortality rates have decreased over the past three decades, the maturing of the baby boomers is expected to bring sharp increases in CVD morbidity and mortality over the next 20-30 years. Between 1948 and 1964, 76 million people were born. By the time that the last of this group reaches the age of 65, the absolute number of people over the age of 65 will have doubled from 32 million to 65 million. [5] Although a segment of this population has taken measures to maintain a healthy lifestyle, a majority is at risk and reaching the critical age for CVD. As this group ages the ethnic, racial and economic profiles of the population will change.

The incidence of age-related diseases will increase in the poor minority because of lifelong substandard medical care and exposure to risk factors associated with a poor social environment in early and mid-life. Many chronic conditions associated with a lower income and lower educational level, for example obesity, hypertension, and diabetes, are expected to be prevalent in this group as they age.[6] It is believed that the occurrence of heart disease and stroke will continue at or above the present level. Therefore, cardiovascular admissions, procedures and healthcare expenditures will increase in a population dependent on shrinking government healthcare dollars. Additional efforts must be made now in this population to reduce risk factors and prevent the progression of existing and future disease. It has been shown that aggressive management of cardiovascular risk factors, through lifestyle modification and medical intervention, can forestall further complications in patients diagnosed with CHD and stroke.

Although there has been a significant reduction in the prevalence of major cardiovascular risk factors, the decrease in the mortality from CVD (CHD and stroke) has occurred primarily because of the advances in the clinical management of these diseases.

An important factor for survival, better outcomes and future well being is timely access to medical treatment. There has been an increased public awareness about the signs and symptoms of a “heart attack” and a “brain attack”, but there continues to be a large portion of the population who delay medical attention and consequently suffer irreversible damage. Emergency medical response and availability of emergency medical services in the community are key for timely management. At present, this often means transport of seriously ill patients to one of the Oahu tertiary centers for services not provided on the outer islands.

Prevention and improved health services for cardiovascular and cerebrovascular disease will improve the health outcomes and quality of life for our population and decrease the state’s financial health burden today and in the near future. But it will, in essence, shift the burden of these disease conditions to an older age in the more distant future. Presently, elderly adults constitute one-eighth of the total U.S. population but are responsible for one third of total health-care expenditures. “In thirty years, the numbers of those 65 and older who will need chronic care is projected to rise to approximately 4 and 5 million and those needing long-term services could be two to three times that many.”[7] Current projections imply that the cost of care for the aging population will be staggering.

B. Measures/Indicators

This chapter was developed by a panel of leaders in the community and in the areas of cardiovascular and cerebrovascular wellness and disease management. Together, they have attempted to define the illnesses and demonstrate the impact of cardiovascular and cerebrovascular disease on the health and wellness of the population of Hawai`i.

The following performance monitors and health indicators were selected for use by the State to evaluate the cardiovascular and cerebrovascular needs and improvements in our communities. The performance measures are intended to be used to measure access to care and community progress towards wellness and are not intended to measure individual institutions or providers. The committee felt that providers are regulated and monitored by multiple regulatory and financial agencies and it would be redundant and not cost-effective for the State to be collecting and monitoring this data .

As the State looks at access and equity issues, we believe that it is important that the quality and performance indicators be community-specific in order to identify those areas that have been successful in identifying problem areas and establishing services to manage CVD in their population. Therefore, most of the indicators and performance monitors that have been selected will require regional and other demographic views to aid the communities in the improvement processes. It was also recognized that collecting data on "heart conditions" and "stroke" is too generic and should be further subdivided to be more specific. The utilization of ICD-9-CM codes[8] (see glossary) will give the State a better picture of the problem areas.

Included are the committee's recommendations and concerns regarding the present and future direction of the cardiovascular management in the State for reduction of the prevalence and mortality caused by this pernicious disease.

It has also been recognized that this chapter and its contents must be a dynamic, living document that must be reviewed and updated at regular intervals and as new technologies and clinical management develop. The prevalence of cardiovascular disease is a chronic, long standing problem and frequently has been set aside for other current medical problems. However, until it is replaced by another disease as the number one "killer" in Hawai`i, it should take the number one priority for the State in its new health plan.

1. Process Measures.

MEASURE NUMBER	MONITOR	DEFINITION	GUIDELINE	HAWAI`I EXPERIENCE	GUIDELINE/ HAWAI`I SOURCE	CROSS-REFERENCE
HDP-1	Proportion of adults who have had their blood cholesterol checked within the preceding 5 years (Recommend monitoring by demographics)	Blood cholesterol tested Hawai`i adults/ all Hawai`i adults	Increase to at least 75% of proportion of adults who have had their blood cholesterol checked within the preceding 5 years	60% of the adults were screened within the past 5 years (Of those 75% within the past year, 89% screened within past 2 years	*Healthy People 2000* 1993 Behavior Risk Factor Survey (BRFS)	
HDP-2	Proportion of adults who have had their blood pressure measured within the preceding 2 years	Hawai`i adults with B/P tested within two years/ all Hawaii adults	Maintain at least 90% the proportion of adults who have had their blood pressure (B/P) measured within the preceding 2 years. (Recommend monitoring by demographics)	89.4% within 1 year 5.4% within 2 years (95% - within 2 years)	*Healthy People 2000* 1995 Behavior Risk Factor Survey (BRFS)	*Maternal, Infant and Child Health*
HDP-3	Proportion of primary care providers who initiate diet and, if necessary, drug therapy at levels of blood choles-	Hawaii adults started on diet &/or drug/ Hawaii adults with elevated blood cholesterol levels	Increase to 75% the proportion of primary care providers who initiate diet and, as necessary, drug therapy at	No data	*Healthy People 2000*	

MEASURE NUMBER	MONITOR	DEFINITION	GUIDELINE	HAWAI`I EXPERIENCE	GUIDELINE/ HAWAI`I SOURCE	CROSS-REFERENCE
	terol consistent with current management guidelines for patients with high blood cholesterol (Recommend monitoring by demographics)		levels of blood cholesterol consistent with current management guidelines for patients with high blood cholesterol			
HDP-4	Proportion of primary care providers who initiate therapy for hypertension consistent with current management guidelines for patients with hypertension	Hawaii adults prescribed blood pressure medicine/ Hawaii adults with hypertension	Increase to 75% the proportion of primary care providers who initiate therapy for hypertension consistent with current management guidelines for patients with hypertension	No data	*Healthy People 2000*	*Maternal, Infant and Child Health*
HDP-5	Proportion of the State's schools that provide nutrition education from preschool - 12th grade, preferably as part of quality school health education	Hawaii schools providing nutrition education as part of health education/Hawaii schools	Increase to at least 75% the proportion of the State's schools that provide nutrition education from preschool - 12th grade, preferably as part of	No data	*Healthy People 2000*	*Maternal, Infant and Child Health*

MEASURE NUMBER	MONITOR	DEFINITION	GUIDELINE	HAWAI`I EXPERIENCE	GUIDELINE/ HAWAI`I SOURCE	CROSS-REFERENCE
			quality school health education			
HDP-6	Proportion of work-sites with 50 or more employees that offer high blood pressure and/or cholesterol education and control activities to their employees	Hawaii work-site offering B/P & cholesterol screening/Hawaii work sites	Increase to at least 50% the proportion of work-sites with 50 or more employees that offer high blood pressure and/or cholesterol education and control activities to their employees	No data	*Healthy People 2000*	
HDP-7	Proportion of counties that have established culturally and linguistically appropriate community health promotion programs for racial and ethnic minority populations	Hawaii counties with community health programs/Hawaii communities	Increase to at least 50% the proportion of counties that have established culturally and linguistically appropriate community health promotion programs for racial and ethnic minority populations	No data	*Healthy People 2000*	
HDP-8	Time from onset of symptoms for Acute Myocardial Infarction (AMI)	Hawaii average time from AMI symptom to presentation to	Decrease the time from onset of symptoms for Acute Myocardial	Mean time from onset of symptoms to presentation in emer-	ACC/AHA AMI Practice Guidelines[9]	

MEASURE NUMBER	MONITOR	DEFINITION	GUIDELINE	HAWAI`I EXPERIENCE	GUIDELINE/ HAWAI`I SOURCE	CROSS-REFERENCE
	or stroke to presentation to emergency department	emergency department	Infarction (AMI) or stroke to presentation to emergency department	gency department: Nation - 125 minutes Hawaii - 125 minutes	1997 National Registry of Myocardial Infarction	
HDP-9	Time from emergency department (ED) arrival to treatment with thrombolytic therapy for AMI and thromboembolic stroke unless contraindicated	Hawaii average time from arrival to ED to initiation of thrombolytic therapy for AMI	Decrease the time from emergency department (ED) arrival to treatment with thrombolytic therapy for AMI and thromboembolic stroke unless contraindicated Goal: -AMI $\leq$ 6hours -Stroke $\leq$ 3 hours	Mean time patient arrival at emergency department to initiation of thrombolytic medication for non transferred: Nation - 36 minutes Hawaii - 37 minutes Mean time from symptom to medication for transferred patients Nation - 135 minutes Hawaii - 122 minutes	ACC\AHA AMI Practice Guidelines 1997 National Registry of Myocardial Infarction	
HDP-10	Number of persons receiving thrombolytic therapy when	Hawaii number of admission receiving thrombolytic therapy	Increase the number of persons receiving thrombolytic	No initial reperfusion Nation - 39% Hawaii - 70%	ACC\AHA AMI Practice Guidelines	

MEASURE NUMBER	MONITOR	DEFINITION	GUIDELINE	HAWAI`I EXPERIENCE	GUIDELINE/ HAWAI`I SOURCE	CROSS-REFERENCE
	appropriate	for AMI/ total number of AMI with indications for therapy	therapy when appropriate		1997 National Registry of Myocardial Infarction	

2. Outcome Measures.

MEASURE NUMBER	MONITOR	DEFINITION	GUIDELINE	HAWAI`I EXPERIENCE	GUIDELINE/ HAWAI`I SOURCE	CROSS-REFERENCE
HDO-1	Proportion of people with high blood pressure who are receiving treatment for high blood pressure	Hawaii adults receiving hypertensive treatment/Hawaii hypertensive adults	Increase to at least 90% the proportion of people with high blood pressure who are receiving treatment for high blood pressure	No data	*Healthy People 2000*	*Maternal, Infant and Child Health*
HDO-2	Prevalence of elevated blood cholesterol and its components (see Glossary) that exceed the recommended AHA standard	Hawaii adults with elevated blood cholesterol (>200mg/dl) and its components/Hawaii adults	Reduce the prevalence of elevated blood cholesterol and its components (see Glossary) that exceed the recommended AHA standard to no more than 20 % among adults	No data	*Healthy People 2000*	

MEASURE NUMBER	MONITOR	DEFINITION	GUIDELINE	HAWAI`I EXPERIENCE	GUIDELINE/ HAWAI`I SOURCE	CROSS-REFERENCE
HDO-3	Prevalence of overweight among people aged 20 and older and among adolescents aged 12 through 19	Hawaii adults (≥20 years) overweight/Hawaii adults Hawaii adolescents (12-19 years) overweight/Hawaii adolescents	Reduce overweight to a prevalence of no more than 20% among people aged 20 and older and no more than 15% among adolescents aged 12 through 19	Overall - 21.8% - Males 28.5% - Females 23.4% -Young adults 16.6% Middle age 30.0% Hawaiian/Part Hawaiian 46.2%	*Healthy People 2000* 1994 BRFSS	*Maternal, Infant and Child Health, Diabetes and Other Chronic Disabling Conditions*
HDO-4	Proportion of people aged 6 and older who engage regularly in light to moderate physical activity for at least 30 minutes per day	Hawaii population ≥6 years exercising 30 minutes per day/ Hawaii population >6 years	Increase to at least 30% the proportion of people aged 6 and older who engage regularly in light to moderate physical activity for at least 30 minutes per day	18.3% meet objectives -Young adults - 6.9% -Adults - 15% -Older adults - 30.5%	*Healthy People 2000* 1994 BRFSS	*Maternal, Infant and Child Health*
HDO-5	Prevalence of cigarette smoking among people aged 20 and older	Hawaii population ≥20 years that smoke/ Hawaii population ≥20 years	Reduce cigarette smoking to a prevalence of no more than 15% among people aged 20 and older	Hawai`i = 20.4%	*Healthy People 2000* 1994 BRFSS	*Behavioral Health*
HDO-6	Deaths from CHD per	CHD deaths/Hawaii	Reduce deaths from CHD to no	1993 CHD Caucasian:	*Healthy People 2000*	

MEASURE NUMBER	MONITOR	DEFINITION	GUIDELINE	HAWAI`I EXPERIENCE	GUIDELINE/ HAWAI`I SOURCE	CROSS-REFERENCE
	100,000 people in <u>all ethnicities</u> in Hawaii Recommend monitoring by demographics	population (break by ethnicity and age) (ICD9 = 410.00 - 411.89, 414.00 - 414.9)	more than 100 per 100,000 people in <u>all ethnicities</u> in Hawaii 1995 Nation 65/100,000	115/100,000 Japanese: 50/100,000 Chinese: 48/100,000 Filipino: 70/100,000 Hawaiian: 122/100,000 Other: 28/100,000	DOH, Vital Statistics, HIDS Data System	
HDO-7	Stroke deaths per 100,000 people in <u>all ethnicities</u> in Hawaii Recommend monitoring by demographics	Hawaii stroke deaths/ Hawaii population (break by ethnicity and age) (ICD9 430 -438)	Reduce Stroke deaths to no more than 20 per 100,000 people in <u>all ethnicities</u> in Hawaii 1993 Nation: 26.5/100,000	1993 Stroke Caucasian: 27/100,000 Japanese: 23/100,000 Chinese: 23/100,000 Filipino: 27/100,000 Hawaiian: 38/100,000 Other: 10/100,000	*Healthy People 2000* DOH, Vital Statistics, HIDS Data System	
HDO-8	Open Heart procedures discharges. Recommend monitoring by demographics	(DRG = 103, 104, 105, 106, 107)	To Be Updated By SHCC's PDC	Statistics (excludes Tripler): 1995 = 1,390 1996 = 1,533	HHIC data	
HDO-9	Cardiac Cath discharges.	(ICD9 = 37.21 - 37.29)	To Be Updated By SHCC's PDC	Statistics: 1995 = 934	HHIC data	

MEASURE NUMBER	MONITOR	DEFINITION	GUIDELINE	HAWAI`I EXPERIENCE	GUIDELINE/ HAWAI`I SOURCE	CROSS-REFERENCE
	Recommend monitoring by demographics			1996 =1,036		
HDO-10	Cardiac Interventions	(MDC05: DRG = 112,116) or (ICD9 = 36.0-36.09 except 36.03, 35.96, 37.7-37.89, 37.94-37.99)	To Be Updated By SHCC's PDC	Statistics (excludes Tripler): 1995 = 9,124 1996 = 9,326	HHIC data	
HDO-11	Cardiology medicine discharges. Recommend monitoring by demographics	(MDC 05: DRG = 121, 122, 124, 127, 132, 138, 139, 140, 141, 143)	To Be Updated By SHCC's PDC	Statistics (excludes Tripler): 1995 = 3,701 1996 = 3,565	HHIC data	
HDO-12	Other circulatory surgery discharges. Recommend monitoring by demographics	(MDC 05: DRG= 05, 113, 114, 130, 144, 145, 478, 479)	To Be Updated By SHCC's PDC	Statistics: 1995 = 4,912 1996 = 4,938	HHIC data	
HDO-13	Neurology medicine discharges. Recommend monitoring by demographics	(MDC01: DRG = 14, 15, 16, 17)	To Be Updated By SHCC's PDC	To Be Updated By SHCC's PDC		

C. Community-specific Factors

From national and state statistics it has been demonstrated that cardiovascular and cerebrovascular disease effects a large portion of our population. Until recently, stroke and heart disease, especially "brain attack" and "heart attack", was considered to be an affliction primarily affecting the 40-year-old white male. We now realize that there exist large disparities in the risk reduction, prevention and clinical management of cardiovascular disease among Hawaii's ethnicities genders and ages. Compounding cultural, social, economic and psychological factors have put various ethnic populations at higher risk for cardiovascular and/or cerebrovascular disease.

Minorities, typically, have been found to be at higher risk for CVD, yet limited population specific education for risk identification, behavior modification, health maintenance and emergency response has taken place in Hawaii.[10] Only recently, has attention been given to CVD in women. Recent studies have shown after menopause, many women experience a rapid progressive course for heart disease. When they do present for a catastrophic event, they tend to be sicker and have a higher mortality rate than their male counterparts. Government healthcare dollars are limited. In 1993, the Hawaiian/Part Hawaiian female ranked third in the state for CHD mortality. (Only the Hawaiian/Part Hawaiian and Caucasian male populations had higher mortality rates). Low-income populations frequently are at higher risk for cardiovascular disease. Although the less-affluent and less educated populations experience higher rates of CVD risk factors such as obesity, smoking, diabetes, and hypertension, Hawai`i community-based CVD prevention programs rarely or adequately occur in these communities. Even when Hawaiian residents of low income, high-risk communities understand the risks of poor diet and exercise habits, they frequently lack the resources to modify their lifestyles. In addition, barriers such as stress and depression among these populations may erode the personal sense of self-worth, a necessary focus of improving health. Inaccessibility of services and cultural and ethnic beliefs may also play a role in seeking medical care.

Those involved in CVD rehabilitative care in Hawaii express concern that even after an initial CVD event, reduction of existing risk factors is not being adequately addressed and consequently these high risk are threatened with a repeated cardiovascular or cerebrovascular event.

Special educational and counseling programs for healthier living have been shown to be cost effective in reducing healthcare expenditures. In Hawaii, there is a need for more education of the modifiable risk factors. Culturally sensitive programs should be established in the communities to educate and identify risk factors and risky behavior. Since many adults are firmly set in their ways and behavior modification for improved health may have limited impact, it is important that the state focus on enhanced educational efforts in the primary and secondary schools system.

An additional benefit derived from improving services in Hawaii's rural areas is enhancing the confidence level of our tourist population. Since tourism is important to our state's economic viability it is essential that the healthcare delivery system throughout the state be of the highest quality with the most state of the art equipment and services. In 1992 the tourist industry contributed 4.9% of the gross state product in the health service area and 5.2% of the employment in health services.[11] In 1996, approximately 6,629,180 tourists visited the state of

Hawaii. . Of that group, 3319 were discharged from a Hawaii's acute care and contributed a total of $46,155,241 to hospital charges. These represent 2.5percent of the total Hawaii acute care discharges and 3.1% of the total charges. Of the 3319 discharges, 777 were discharged with a final cardiac diagnosis. Of the total non-Hawaii charges 31.2% were for patient discharges with a final cardiac diagnosis. [12] It is important that those visiting our islands are confident that we can provide the most current medical services, especially in an emergency situation.

D. Priorities

Attention should be given to the following service issues when considering the needs of the state for improving the cardiovascular health of its people:

1. Access.

- The presence of adequate culturally sensitive community outreach programs for screening, health education and counseling of its population
- The presence of cardiovascular rehabilitative services in certain locations to improve access for those requiring these services
- Increase the proportion of the State's schools that provide nutrition education and heart healthy lunches to their children
- Enhanced community awareness of the signs and symptoms of a "heart" or "brain" attack and the importance of seeking medical treatment in a timely manner

2. Quality.

- An emergency medical system that has state of the art equipment to improve the continuity of care during transport
- Increased emergency ambulance services, where needed, to improve response time in those remote areas not meeting State standards.
- The establishment of a telemedicine system within the state for consultation to outlying areas from the tertiary centers to improve the quality of cardiovascular care

3. Cost effectiveness.

- The presence of culturally sensitive community health centers for treatment and management of acute and chronic conditions
- Recognition of the importance of telemedicine evaluation in a high quality, cost effective state health system
- Recognition of the importance of prevention and education in the health of our people
- Aggressive management of diabetes, hypertension and hypercholesterolemia to reduce the prevalence of CVD
- Increased funding and energies put toward primary and secondary, schools for education and healthy lifestyle training

RESOURCES

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NOTES

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